REMARKS

Status of Claims

Claims 1, 4, 5, 8 and 12 are presented in clean form incorporating the amendments made in Applicant's reply of September 4, 2007 to the previous action by the Office. Claims 11 and 13-18 are as presented in previous replies; claims 6, 9 and 10 are in their original form as filed; and claims 2, 3 and 7 are as canceled by, and claim 19 as newly presented in, the September 4, 2007 amendment.

Claim Rejections – 35 U.S.C. § 112

The removal of the rejection of claim 14 under 35 U.S.C. § 112, first paragraph is gratefully acknowledged.

Claim Rejections – 35 U.S.C. § 102

Claims 1, 4, 6, 9, 11-12 and 14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being obvious over, Int'l. Pat. App. Pub. No. WO 01/54188 to *Harada et al.*, of which U.S. Pat. No. 6,771,483 is an English-language equivalent. Applicant counters this rejection as follows.

With the present invention, a wafer holder is manufactured forming its electrical circuit by screen printing, from a sinter internally in which pores are present, wherein it was discovered that by adjusting the porosity, warping and cracking during high-temperature heating is prevented. As noted in paragraph [0017] of the specification as filed, this discovery runs counter to the conventional wisdom.

In the Harada et al. reference, the electrical circuit is formed from a metallic electrode layer (alloy) of tungsten, aluminum, etc. by thermal spraying, yet with their thermal spraying technique, because metal that has been melted to above its melting point is flame-sprayed, generation of gas from the metal—the metal components gasifying at high temperature—is inevitable, such that numerous pores become incorporated within the manufactured electrical circuit.

In contrast, in the present invention, since a mixture of a metal powder and a sintering promoter are baked hard at below melting point of the metal, generation of gas by the melting of the metal is unlikely to occur. With screen printing, compared with thermal spraying techniques, because the heating is done at below the melting point, the electrical circuit is constituted by a sinter that incorporates a sintering promoter, wherein creation of pores in the electrical circuit interior is slight, but from research for the present invention it became evident that if the pores are overly decreased, warping and cracking will occur during high-temperature ramp-up.

In *Harada et al.*, the electrostatic chuck is manufactured so as intentionally to reduce the porosity to the extent possible, whereas in the present invention, conversely, screen printing—whereby, compared with routine thermal-spraying techniques, pores are less likely to be generated—is used to deliberately secure pores, meaning that pores are actively introduced; hence the technological category of the present invention differs totally from that of *Harada et al*.

More specifically, as set forth in paragraph [0046] of the present specification, the present invention controls porosity by adjusting the baking temperature, amount of binder, and amount of added solvent, while *Harada et al*. takes porosity to be a defect, and simply mentions that, fewer pores being better, problems will not arise if the porosity of the metallic electrode layer is 1 to 7%, and if the porosity of the upper and lower insulating layers 5 and 3 is 1 to 8%, which differs completely from porosity management as according to the present invention.

On the other hand, in the present invention, with the objective that pores prevent warping and cracking during high-temperature heating, pores are not taken to be flaws, but instead are positively introduced. Thus, in the present invention, with pores being regarded as a requisite structural element, the thinking is utterly different from that of *Harada et al*.

It is respectfully submitted that for the foregoing reasons claim 1 in its current form should be held allowable, and thus the remaining claims rejected under this section of the Office action—claims 4, 6, 9, 11-12 and 14—should be held allowable as depending from an allowable base claim.

Claim Rejections – 35 U.S.C. § 103

Claims 1, 4-6 and 8-19: Shamouilian et al. '958 in view of Heimann et al. '707

Claims 1, 4-6 and 8-19 remain rejected as being unpatentable over U.S. Pat. No. 6,494,958 to Shamouilian et al. in view of U.S. Pat. No. 6,620,707 to Heimann et al.

Claims 1, 4-6 and 8-19: Kuibira et al. '911 in view of Heimann et al. '707

Claims 1, 4-6 and 8-19 remain rejected as being unpatentable over U.S. Pat. App. Pub. No. 2002/0007911 to Kuibira et al., in view of the Heimann et al. reference.

Claim 1, 4-6 and 8-19: Niori et al. '246 in view of Heimann et al. '707

Claims 1, 4-6 and 8-19 were rejected as being unpatentable over U.S. Pat. No. 6,197,246 to Niori et al. in view of the Heimann et al. reference.

Below, Applicant addresses these separate rejections concurrently.

In the Shamouilian et al. and Niori et al. references, electrical circuits of metal mesh are disclosed, but this means that the components differ totally from the present invention, in which the electrical circuit layer that is manufactured is a metal-powder sinter. Moreover, the structures of the *Shamouilian et al.* and *Niori et al.* electrical circuits, being derived from metal mesh, are structures in which through-holes arise vertically, while with the present-invention structure—which, being a sintered thin layer, does not having through-holes even though there are pores—the form differs completely.

The Heimann et al. reference discloses a ceramic sensor employing a paste in which platinum powder and a metal oxide are mixed, which has nothing to do with a wafer holder as set forth in claim 1 of the present application; moreover, since the sensor is not used in a semiconductor manufacturing apparatus, it would be extraordinarily unlikely that a person skilled in the art would find it predictable to combine in the teachings of this reference.

The Kuibira et al. reference has a similar manufacturing method, but no thinking as to whether pores are present in the electrical circuit is suggested, nor is any objective of controlling porosity to prevent warping and cracking during high-temperature heating noted. In the present invention, detailed research into porosity and displacement made these relationships—as set forth in the tables in the present specification—clear, and numerous investigative case studies resulting in arriving at the invention of a wafer holder suited semiconductor manufacturing apparatuses.

In sum, in contrast to introducing pores to the extent possible, as in the present invention, with the cited references the concept differs, in that pores are made fewer to the extent possible, in an attempt to eliminate defects.

Accordingly, it is believed that independent claims 1, 18 and 19 are not obvious over the cited combinations of references, and that the rejections have been overcome. Independent claim 1 thus being allowable, it follows that its dependent claims 4-6 and 8-17 should also be held allowable.

Conclusion

Accordingly, Applicant courteously urges that this application is in condition for allowance. Reconsideration and withdrawal of the rejections is requested. Favorable action by the Examiner at an early date is solicited.

Respectfully submitted,

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